CATERPILLAR

Service Manual

416C BACKHOE LOADER

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Product: BACKHOE LOADER
Model: 416C BACKHOE LOADER 4ZN
Configuration: 416C Backhoe Loader Center Pivot, Single Tilt 4ZN16044-50156 (MACHINE) POWERED BY 3054 Engine

Disassembly and Assembly
3054 ENGINE SUPPLEMENT FOR 416C, 426C, 428C, 436C & 438C BAC
Media Number -SENR1203-01 **Publication Date -21/01/1998** **Date Updated -01/11/2007**

SENR12030029

Water Separator

SMCS - 1263-017

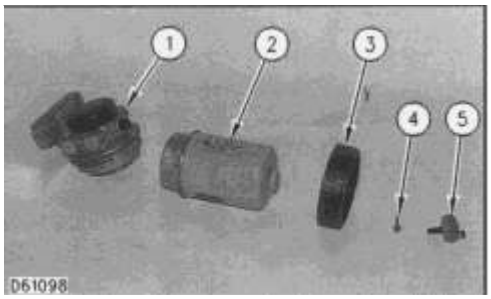
Disassemble & Assemble Water Separator

Start By:

a. remove water separator

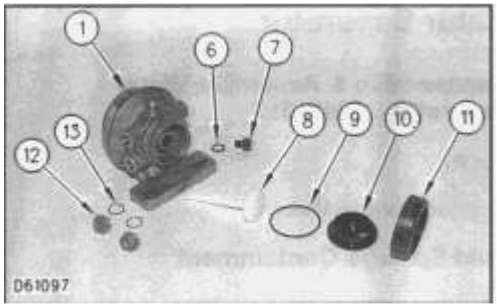
Fluid Spillage Containment

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the machine. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids. Refer to "Tools And Shop Products Guide", NENG2500 for tools and supplies suitable to collect and contain fluids in Caterpillar machines. Dispose fluids according to local regulations and mandates.



1. Remove valve (5) and washer (4).

2. Remove nut (3) and filter element (2) from filter base (1).



3. Remove nut (11), cap (10), seal (9), and regulator (8) from filter base (1).

4. Remove plugs (12) and washers (13) from filter base (1).

5. Remove plug (7) and O-ring seal (6) from filter base (1).

NOTE: Assembly the water separator in reverse order.

End By:

install water separator

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Product: BACKHOE LOADER
Model: 416C BACKHOE LOADER 4ZN
Configuration: 416C Backhoe Loader Center Pivot, Single Tilt 4ZN16044-50156 (MACHINE) POWERED BY 3054 Engine

Disassembly and Assembly
3054 ENGINE SUPPLEMENT FOR 416C, 426C, 428C, 436C & 438C BAC
Media Number -SENR1203-01 **Publication Date -21/01/1998** **Date Updated -01/11/2007**

SENR12030028

Water Separator

SMCS - 1263-010

Remove & Install Water Separator

Start By:

a. remove left engine cover

Fluid Spillage Containment

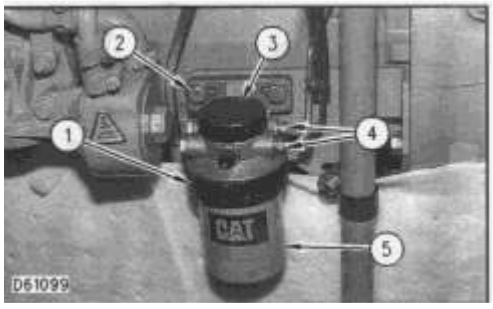
Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the machine. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids. Refer to "Tools And Shop Products Guide", NENG2500 for tools and supplies suitable to collect and contain fluids in Caterpillar machines. Dispose fluids according to local regulations and mandates.

WARNING

At operating temperature, the engine coolant is hot and under pressure. The radiator and all lines to heaters or the engine contain hot water or steam. Any contact can cause severe burns. Look at the sight gauge to check the coolant level. The coolant level should be in the green range. If necessary, remove the fill cap only after the engine has been stopped and the cap is cool enough to remove with your bare hand. Remove the cooling system fill cap slowly to relieve pressure. Cooling system condition contains alkali that can cause personal injury.

Avoid contact with the skin and eyes and do not drink. Allow cooling system components to cool before draining.

NOTE: Put identification on all lines, hoses, wires and tubes for installation purposes. Cap and plug all lines, hoses and tubes to prevent foreign material from entering the system.



1. Loosen nut (1) and remove water canister (5).

2. Drain water from water separator into a suitable container for storage or disposal.

3. Disconnect two tube assemblies (4).

4. Remove two bolts (2) and remove water separator (3).

NOTE: Install the water separator in the reverse order.

NOTE: Refer to the Topic "Lubricant Viscosities and Refill Capacities" in the Operation and Maintenance Manual for the proper filling procedure and the proper levels for the hydraulic system and the cooling system.

End By:

a. install left engine cover

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Sat Apr 23 01:45:31 UTC+0530 2022

Product: BACKHOE LOADER
Model: 416C BACKHOE LOADER 4ZN
Configuration: 416C Backhoe Loader Center Pivot, Single Tilt 4ZN16044-50156 (MACHINE) POWERED BY 3054 Engine

Disassembly and Assembly
3054 ENGINE SUPPLEMENT FOR 416C, 426C, 428C, 436C & 438C BAC
Media Number -SENR1203-01 **Publication Date -21/01/1998** **Date Updated -01/11/2007**

SENR12030027

Engine & Transmission

SMCS - 1004-029

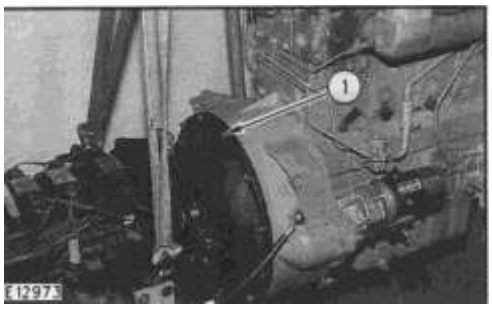
Separate & Connect Engine From Transmission

Start By:

a. remove engine, torque converter & transmission

Fluid Spillage Containment

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the machine. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids. Refer to "Tools And Shop Products Guide", NENG2500 for tools and supplies suitable to collect and contain fluids in Caterpillar machines. Dispose fluids according to local regulations and mandates.



1. Attach a suitable lifting device to the transmission as shown.

2. Remove twelve bolts (1) from the transmission. Separate the engine from the transmission. The weight of the transmission is 204 Kg (450 lb).

NOTE: Connect the engine to the transmission in reverse order.

End By:

a. install engine, torque converter & transmission

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Product: BACKHOE LOADER
Model: 416C BACKHOE LOADER 4ZN
Configuration: 416C Backhoe Loader Center Pivot, Single Tilt 4ZN16044-50156 (MACHINE) POWERED BY 3054 Engine

Disassembly and Assembly
3054 ENGINE SUPPLEMENT FOR 416C, 426C, 428C, 436C & 438C BAC
Media Number -SENR1203-01 **Publication Date -21/01/1998** **Date Updated -01/11/2007**

SENR12030026

Engine, Torque Converter, Transmission & Implement Pump

SMCS - 1004-010

Remove & Install Engine, Torque Converter, Transmission & Implement Pump

Tools Needed	A
6V-3145 Load Leveler	1

Start By:

a. remove radiator, oil cooler and condenser

b. remove muffler assembly

c. remove front drive shaft

d. remove main drive shaft

Fluid Spillage Containment

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the machine. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids. Refer to "Tools And Shop Products Guide", NENG2500 for tools and supplies suitable to collect and contain fluids in Caterpillar machines. Dispose fluids according to local regulations and mandates.

WARNING

Effective July 1, 1992 regulations prohibit the venting of any refrigerant into the atmosphere. Refer to Caterpillar publication SENR5664 and NEDG5065 for the proper procedure, equipment and tools to reclaim refrigerant from any Caterpillar machine.

WARNING

Always wear goggles when working on air conditioning systems. The system is under pressure at all times, engine running or not. Escaping refrigerant R-134A can cause freezing of human flesh.

Do not smoke while working on air conditioning systems. INHALING REFRIGERANT 134A THROUGH ANY SMOKING MATERIAL, ALTHOUGH NOT TOXIC OR FLAMMABLE, CAN GENERATE LETHAL PHOSGENE GAS AND CAUSE VIOLENT ILLNESS OR DEATH. ALSO, HEAT MUST NEVER BE APPLIED TO A CHARGED SYSTEM. See Air Conditioning And Heating Service Manual, Form number SENR5664, for more information on removal and installation of lines and refrigerant from the system.

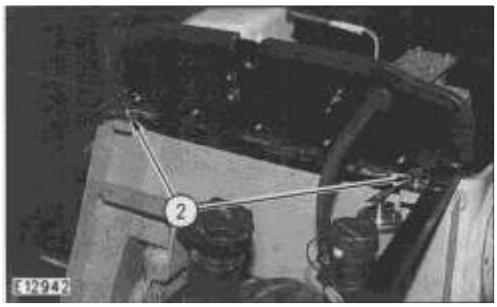
NOTE: For purging and charging the air conditioning system, refer to the Air Conditioning And Heating Service Manual SENR5664.

NOTE: Loader lift arms have been removed for photographic purposes.

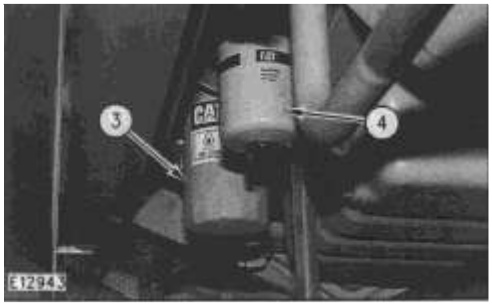
NOTE: Put identification on all lines, hoses, wires and tubes for installation purposes. Cap and plug all lines, hoses and tubes to prevent foreign material from entering the system.

NOTE: Drain all fluids in a suitable container for storage or disposal.

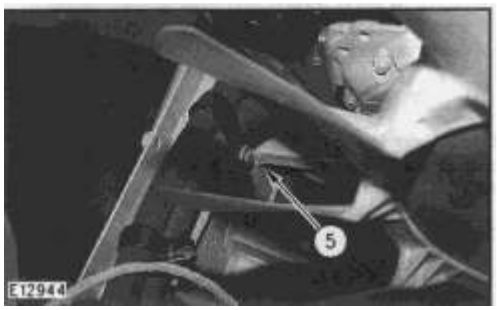
1. Disconnect cable assembly (1) from the hood assembly.



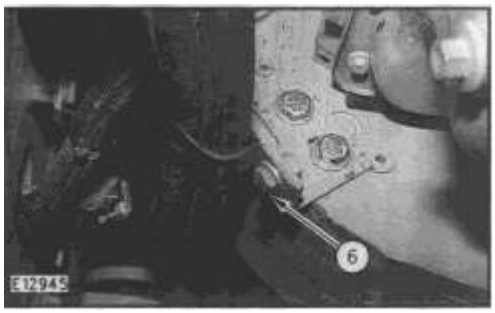
2. Remove two bolts (2) from the hood assembly and remove the hood assembly.



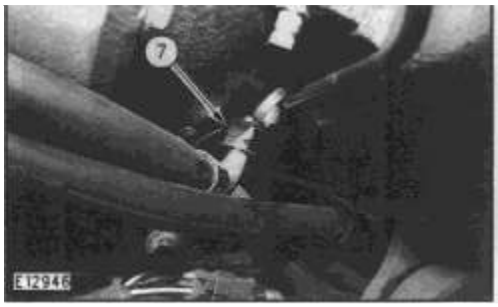
3. Remove oil filter (3) and fuel water separator (4).



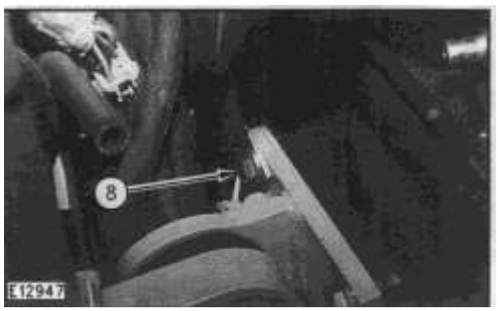
4. Remove bolt (5) from the frame.



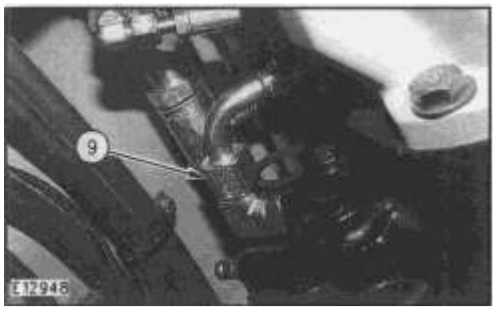
5. Remove bolt (6) from the bell housing.



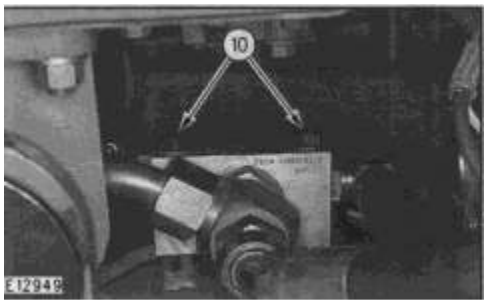
6. Disconnect hose assembly (7) from the transmission.



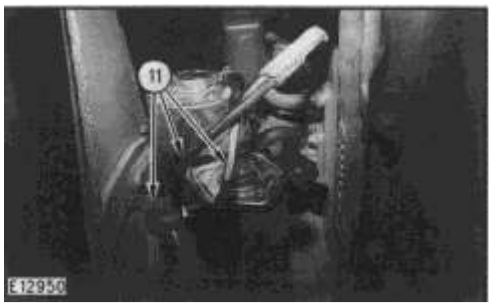
7. Remove bolt (8) from the transmission.



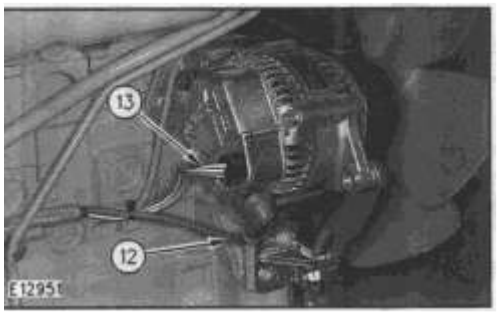
8. Disconnect hose assembly (9) from the transmission.



9. Remove two bolts (10) and remove the valve and the hose assemblies.



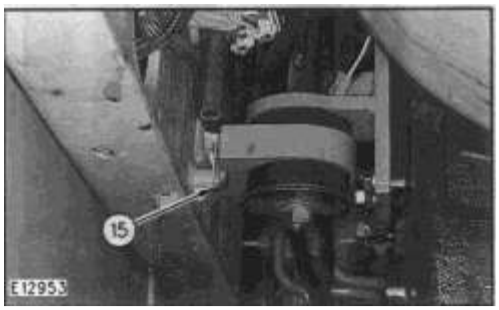
10. Disconnect three wires (11) from the starter.



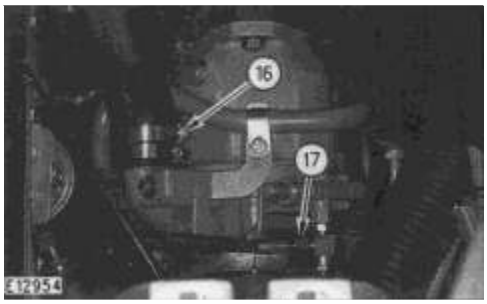
11. Disconnect wire (12) and plug (13) from the alternator.

12. Disconnect wire (14) from the water temperature regulator.

13. Remove the tie wraps and disconnect the wire from the engine.

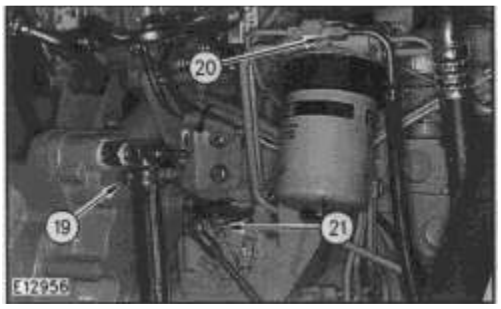


14. Remove bolt (15) from the frame.



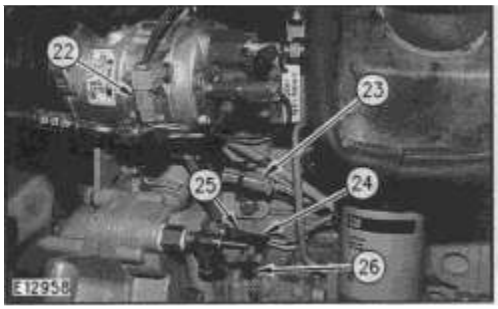
15. Disconnect hose assemblies (16) and (17).

16. Disconnect hose assembly (18).



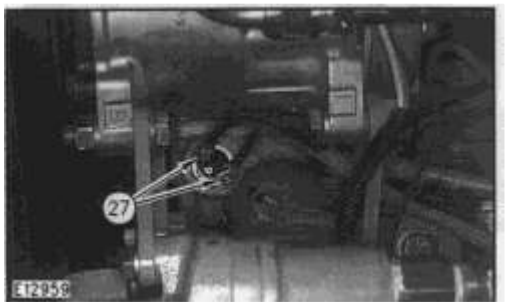
17. Disconnect hose assemblies (19) and (20) and disconnect throttle linkage (21).

18. Disconnect wiring harness (21).

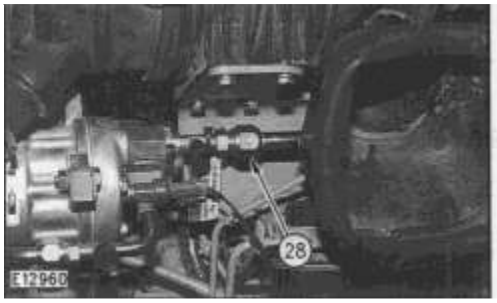


19. Disconnect wiring harnesses (22) and (23).

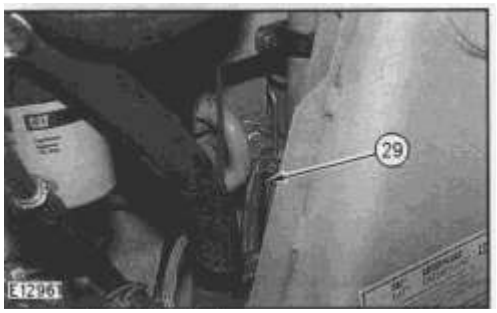
20. Disconnect wires (24), (25) and (26).



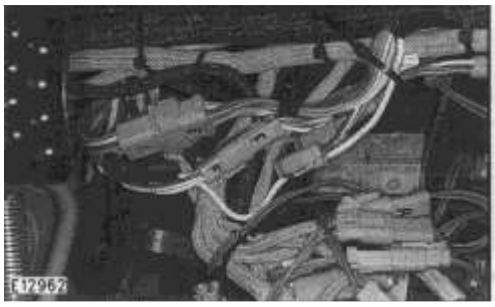
21. Disconnect two wires (27).



22. Purge refrigerant from the system. Disconnect air conditioning hose assembly (28).

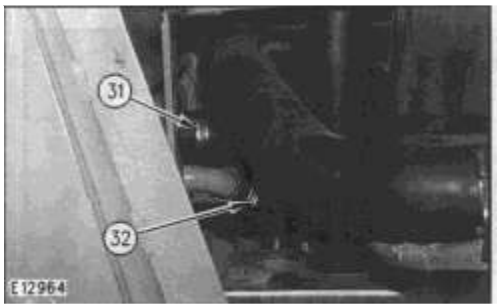


23. Disconnect hose assembly (29).

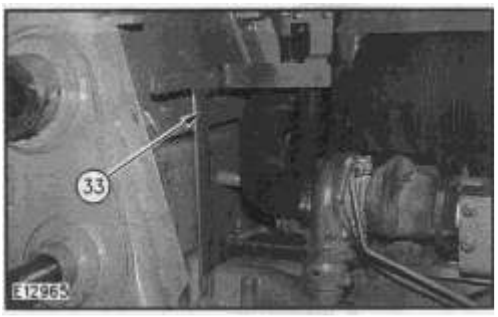


24. Disconnect the wiring harnesses.

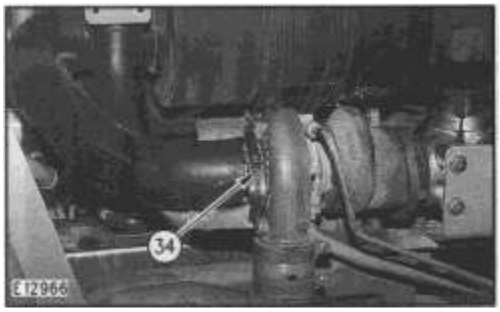
25. Disconnect wiring harness (30).



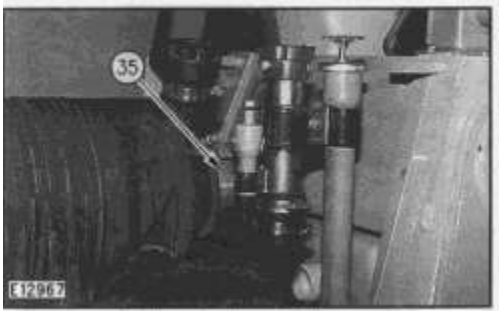
26. Disconnect hose assemblies (31) and (32).



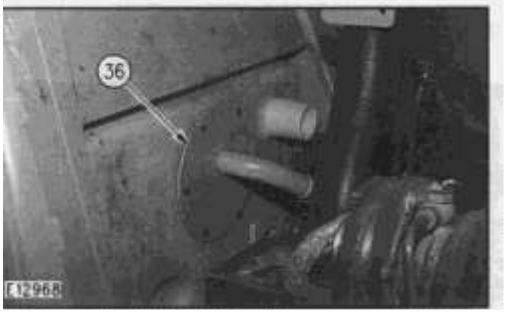
27. Disconnect and remove bracket assembly (33).



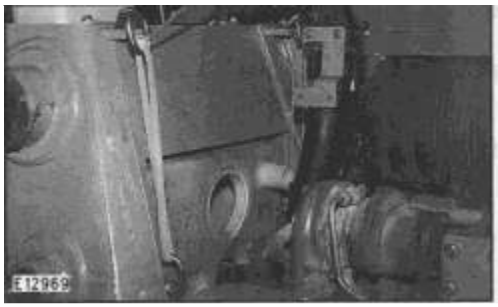
28. Disconnect hose assembly (34).



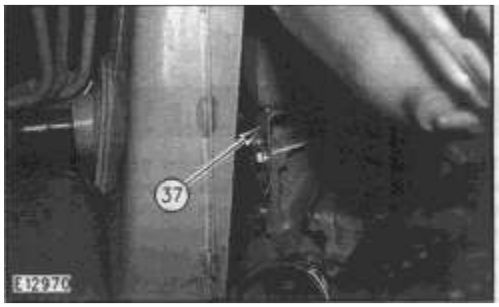
29. Disconnect and remove hose assembly (35).



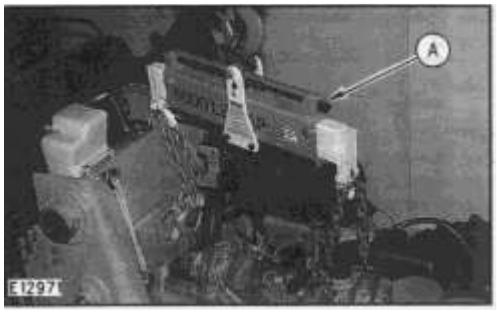
30. Remove six bolts and remove plate assembly (36).



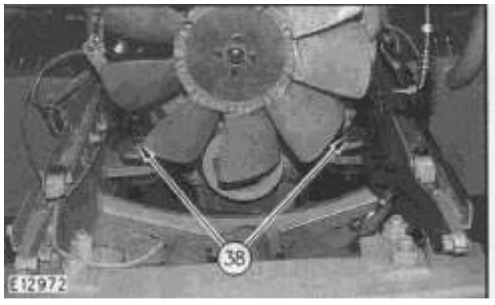
31. Attach a suitable lifting device as shown to the hydraulic tank so that it does not fall during removal of engine, torque converter, transmission and implement pump.



32. Remove the four bolts on two hydraulic tank mounting brackets (37).



33. Attach tooling (A) and a suitable lifting device to the engine as shown.



34. Remove four mounting bolts (38).

35. Remove the engine, torque converter, transmission and implement pump from the machine as a unit. The weight of the unit is 704 kg (1550 lbs).

NOTE: Install the engine, torque converter, transmission and implement pump in the reverse order of removal.

End By:

a. install main drive shaft

b. install front drive shaft

c. install muffler assembly

d. install radiator, oil cooler and condenser

NOTE: Refer to the Topic "Lubricant Viscosities and Refill Capacities" in the Operation and Maintenance Manual, publication number SEBU6873 for the proper filling procedure and the proper levels for the hydraulic system and the cooling system.

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Product: BACKHOE LOADER
Model: 416C BACKHOE LOADER 4ZN
Configuration: 416C Backhoe Loader Center Pivot, Single Tilt 4ZN16044-50156 (MACHINE) POWERED BY 3054 Engine

Disassembly and Assembly
3054 ENGINE SUPPLEMENT FOR 416C, 426C, 428C, 436C & 438C BAC
Media Number -SENR1203-01 **Publication Date -21/01/1998** **Date Updated -01/11/2007**

SENR12030025

Cab

SMCS - 7301-010

Remove & Install Cab

Tools Needed	A	B	C
133-9874 Spreader Bar	2		
133-9873 Lifting Brackets	2		
138-7573 Link Brackets		2	
6V-3145 Load Leveler			1

Start By:

a. remove rear wheels

Fluid Spillage Containment

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the machine. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids. Refer to "Tools And Shop Products Guide", NENG2500 for tools and supplies suitable to collect and contain fluids in Caterpillar machines. Dispose fluids according to local regulations and mandates.

WARNING

Effective July 1, 1992 regulations prohibit the venting of any refrigerant into the atmosphere. Refer to Caterpillar publication SENR5664 and NEDG5065 for the proper procedure, equipment and tools to reclaim refrigerant from any Caterpillar machine.

WARNING

Always wear goggles when working on air conditioning systems. The system is under pressure at all times, engine running or not. Escaping refrigerant R-134A can cause freezing of human flesh.

Do not smoke while working on air conditioning systems. INHALING REFRIGERANT 134A THROUGH ANY SMOKING MATERIAL, ALTHOUGH NOT TOXIC OR FLAMMABLE, CAN GENERATE LETHAL PHOSGENE GAS AND CAUSE VIOLENT ILLNESS OR DEATH. ALSO, HEAT MUST NEVER BE APPLIED TO A CHARGED SYSTEM. See Air Conditioning And Heating Service Manual, Form number SENR5664, for more information on removal and installation of lines and refrigerant from the system.

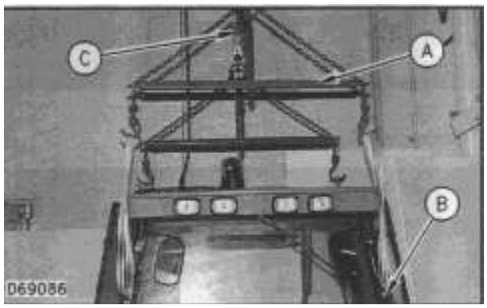
NOTE: For purging and charging the air conditioning system, refer to the Air Conditioning And Heating Service Manual SENR5664.

WARNING

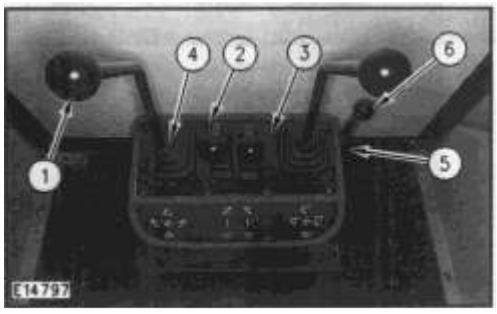
At operating temperature, the hydraulic oil tank is hot and under pressure. Hot oil can cause burns. Remove the breather filter cap only when the engine is stopped and the breather filter cap is cool enough to touch. Slowly loosen the breather filter cap to release any pressure in the hydraulic tank. Be cautious of hot hydraulic oil when any lines are disconnected in the hydraulic system.

NOTE: Put identification on all lines, hoses, wires and tubes for installation purposes. Cap and plug all lines, hoses and tubes to prevent foreign material from entering the system.

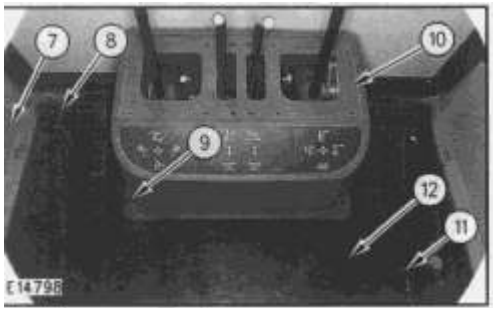
NOTE: Drain all fluids in a suitable container for storage or disposal.



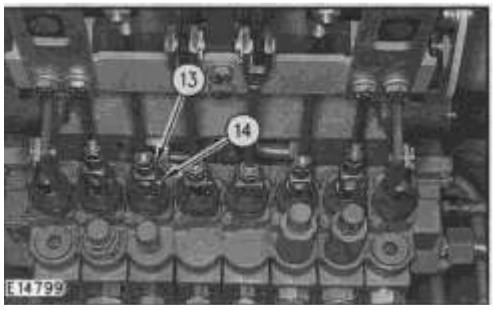
1. Attach Tool (A) to each end of Tool (C). Attach straps to Tool (B).



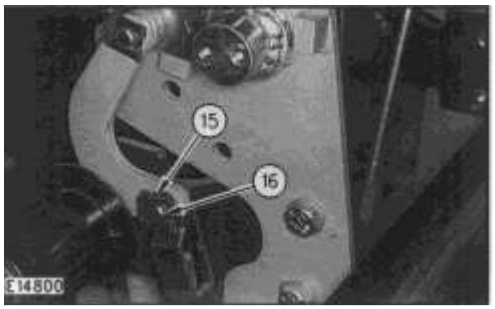
2. Remove four knobs (1), eight fastener clips (2), panel (3), four boots (4), two bolts (5) and lever (6).



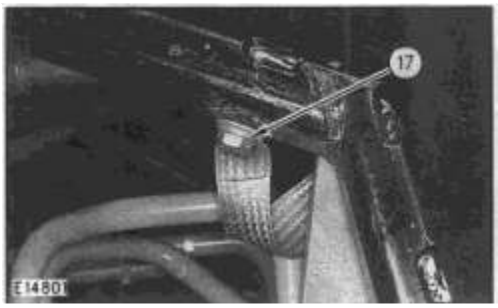
3. Remove two bolts (7), two pedals (8), four bolts (9), rear console (10), four screws (11), and plate (12).



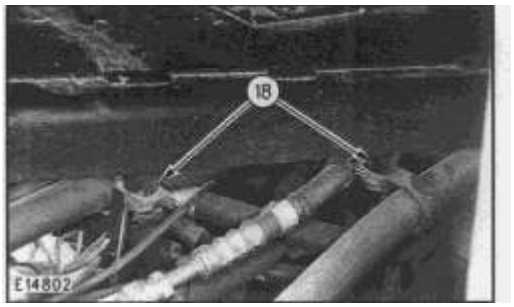
4. Remove eight clips (13) and eight pins (14).



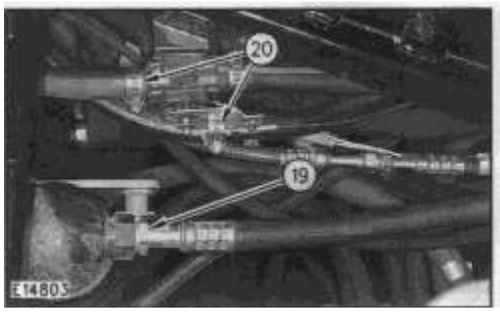
5. Remove clip (15) and pin (16).



6. Remove bolt (17) and disconnect the ground braid.



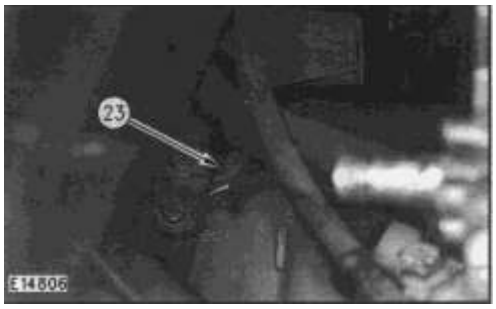
7. Remove two bolts (18) and disconnect the two hose clamps.



8. Disconnect two air conditioning hoses (19). Remove two hose clamps (20) and disconnect the two heater hoses.

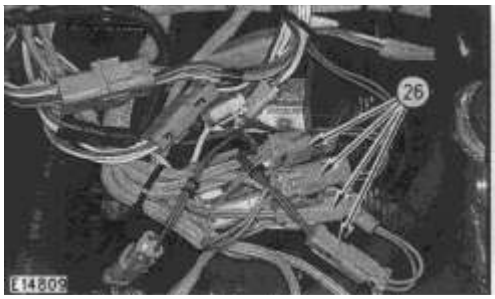
9. Disconnect wire harness (21).

10. Disconnect 5 wire harnesses (22).

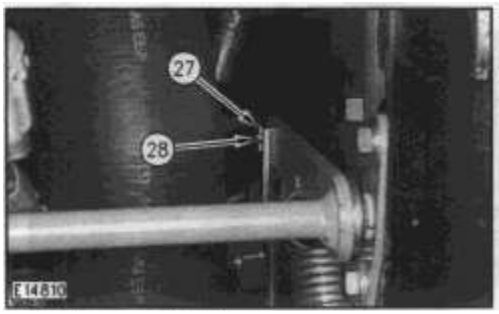


11. Disconnect wire harness (23).

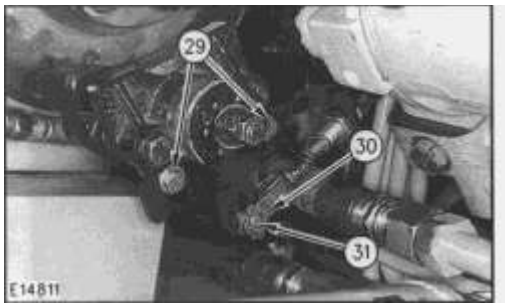
12. Remove four screws (24) and floor plate (25).



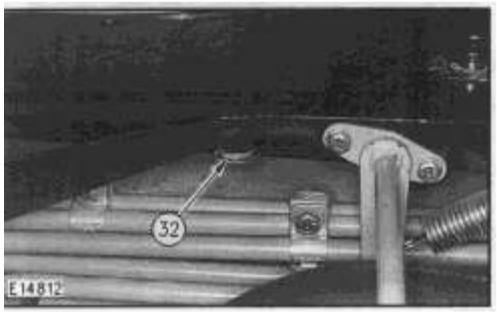
13. Disconnect wire harnesses (26).



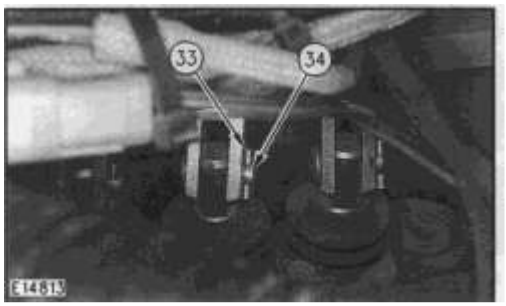
14. Remove clip (27), pin (28) and the throttle linkage.



15. Remove two bolts (29), clip (30) and pin (31). Remove the parking brake.

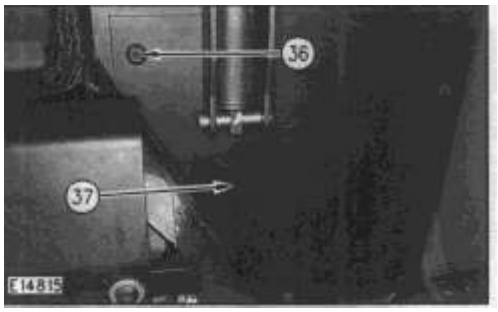


16. Remove bolt (32) and disconnect the clip.

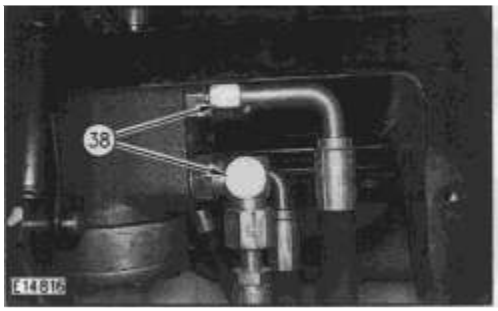


17. Remove three clips (33) and three pins (34) and disconnect the linkages.

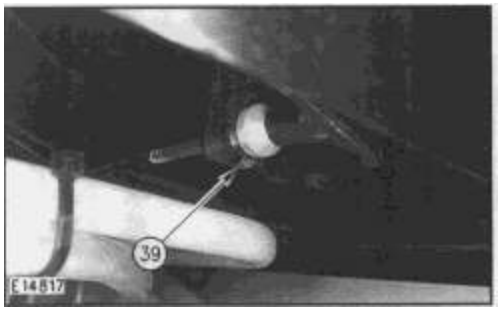
18. Disconnect wire harness (35).



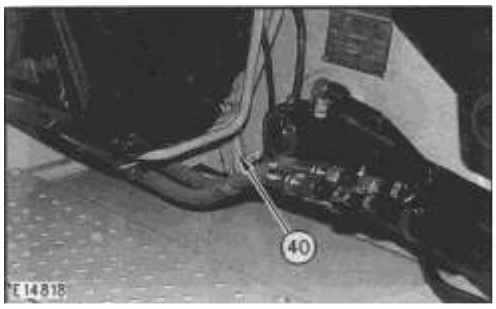
19. Remove four bolts (36) and panel (37).



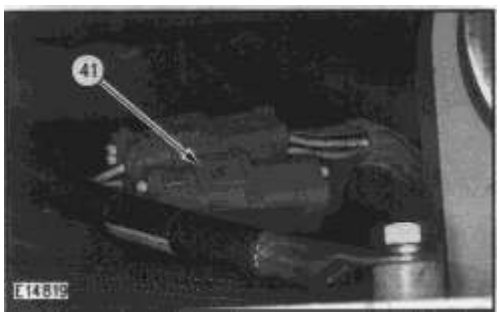
20. Remove five hydraulic hoses (38) from the steering valve.



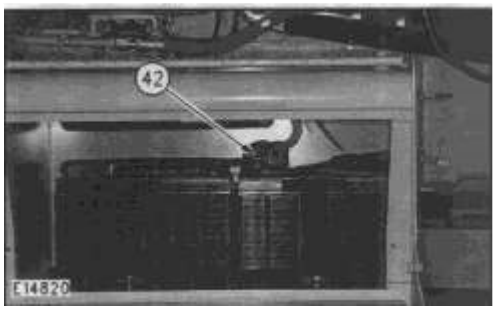
21. Disconnect nut (39) and disconnect the hood release.



22. Disconnect two wire harnesses (40).



23. Disconnect two wire harnesses (41).



24. Disconnect cable (42) from the positive terminal cable.

24. Remove two cab mounting bolts (43).

25. Adjust all lifting Tooling and raise slowly making sure all wiring harnesses and hoses have been disconnected and remove cab.

NOTE: Install in reverse order of removal.

NOTE: Refer to the Operation & Maintenance Manual, publication number SEBU6873 for all fluid capacities and the proper filling procedures.

End By:

a. install rear wheels

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